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The role of strategic health impact assessment in sustainable development

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Health as a major policy criterion

Mainstream economics still uses growth, assessed as GDP, to measure an economy's size and strength. Heterodox economists (in the broadest sense) have argued for alternative measures, for example the Human Development Index. Health tends to find a place in such indicators, but usually only in the form of rather crude measures like life expectancy at birth. From a health viewpoint, this is comparable to assessing economic development using *per capita* GDP.

It is increasingly realised that health, conceived of in broad terms, is an important component of sustainable development, as it is central to human wellbeing. Starting with single issues such as food safety/BSE and deaths from urban air pollution in the 1990s, the health impacts of policies in apparently unrelated areas such as the food/agriculture industry and transport became clear to the general population and to politicians, not just to health specialists.

The conception of health implied here is a simple one: the health status of the members of the affected population, implying that an increase (decrease) can be taken as an indicator of benefit (harm) for mainstream policy development and implementation. It has to include not only the proximal determinants of health such as occupational/environmental exposures and aspects of "lifestyle" such as smoking, but also the factors that might affect their presence – the "determinants of determinants" [1].

It is proving difficult to achieve integration of health into mainstream policy, even where health damage and/or potential health gain are large. A prime example is the "obesogenic environment" that an increasing number of populations inhabit, in which physical activity is declining due to more sedentary occupations and car dependence, plus large quantities of calorie-dense food are ready available. Governments and international bodies are hugely worried by rising obesity, but they fail to engage with its root causes – even though the policies that would be involved would have other benefits in terms of sustainable development, including lower greenhouse gas emissions and other environmental benefits, as well as challenging some aspects of socioeconomic inequality.

One of the few policies that has successfully challenged the dominance of private motorised transport – introduced at considerable political risk by the then mayor of London – was the congestion charge in central London, accompanied by other measures such as radical expansion of the cycle-lane network and a large increase in the number of buses. And yet the monitoring of this policy was confined to air pollution plus road deaths and injuries, changes in which were miniscule. It did not include the potentially most important health benefit, the increase in physical activity consequent on modal shift to more active forms of transport especially in previously inactive people, so that the opportunity was lost to investigate whether physical activity levels increased. The potential, and very likely the actual, health benefits of the policy were large, but most health professionals, researchers and funding bodies failed to make the necessary connections.

One barrier is that the term “health” has additional connotations, so that non-health experts do not see the health relevance of the policies that they enact and implement. Sometimes it is taken as a synonym for healthcare, as in the phrase “health sector”. This misleading term mistakenly locates the importance of health to the economy and society solely in those activities that are an organised ***response*** to ill-health. The wider impacts of economic and social life on health, both positive and negative, thus become obscured. A second, related, barrier is that health is seen as the province of medical specialists, that it involves technical knowledge that is not available to the broader population. While it is true that reliable information is essential as the basis for considering health, it is possible to make the necessary specialist knowledge accessible for non-specialists, just as is done in other areas such as climate science. A third barrier is that even when it is recognised that health is as much about preventing disease and promoting health as about the healthcare response to existing problems, this is seen as a question of individual behaviour and risk. In the obesity example this could include food choices and transport decisions, and also individual genetic risk – although the latter could not explain the rapid increase in obesity that has been seen. The nature of the transport and food systems are not fundamentally reconsidered in the light of their health impacts.

One way of seeking to address this has been the introduction of Health Impact Assessment (HIA) to evaluate certain types of capital project, such as airport extensions, new bypasses or bridges, regeneration schemes, etc. This is described in the next section. However, despite many benefits, the increasing use of HIA is having limited impact.

The irony is that assessment of health impacts could play a highly useful role in developing and implementing policies for sustainable development. This is for three types of reason. First, the three major components of sustainable development – the economic, the social and the environmental realms – are precisely the three main categories of determinants that affect determinants of health.

Briefly, economics affects health because under conditions of absolute poverty an increase in income reduces the risk of disease; this relationship becomes weaker as prosperity rises, so that at current developed-world living standards it disappears [2] – the same saturating curve as is seen if happiness is used as an outcome [3]. The social realm has a strong impact on health, as the literature on social inequalities and health clearly shows [4]; similarly, social cohesion has a positive health effect. The environment is also highly important for health, as is seen in the consequences of pollution, depletion of resources e.g. fresh water, etc, as well as global climate change. Even biodiversity, often seen as a separate “non-human” type of criterion, is relevant to health [5].

The second type of reason is that health is an indispensable part of the way that benefits and disbenefits of policies can be evaluated, at least in relation to how humans are affected – including future generations, a key component of the sustainable development perspective. It is one of the major components of wellbeing, along with happiness and autonomy. To take the example of environmental pollution, there would be little concern over a substance that has no toxic effects; it is not the presence of the pollutant that matters, rather it is its health consequence.

The third is that health deals in basic needs, whereas economic criteria relate to effective demand. Willingness to pay is commonly used as a metric in policy discussions, but it cannot be separated from the *ability* to pay, even in principle. Criticism of the concept tends to focus on problems in its measurement, which are real enough, but miss the point that its use systematically favours those with most resources. A rich person is willing to pay a vast fortune to bring about a desired consequence, such as to save a loved one, whereas a poor person does not have this option. In contrast, a health focus automatically favours equity.

For example, by analysing energy use in relation to its health impacts [6], the major conclusions are that (a) access to energy sources has definite health benefits through a large number of distinct pathways – with the same saturating curve as is observed with health or happiness in relation to income; (b) low-income households tend to lack sufficient energy for their health needs, being subject both to fuel poverty and to fuel insecurity; (c) the types of fuel available to poor households are typically highly polluting, causing pneumonia especially in young children, with extremely high health impact – it is one of the major causes of infant mortality globally. If this analysis is used to inform policy, priority would be given to energy provision tied to poverty reduction and to (indoor) environmental improvement, and it would be done in such as way as to accentuate those aspects that bear most on human wellbeing.

The question addressed in this paper is how to better promote sustainable development by incorporating health as a set of criteria into mainstream policy, in parallel with other relevant types of criterion. A key issue is that HIA does not generally do what its name would suggest, i.e. assess the health impact. HIA as a procedure has many strengths, but is also has some weaknesses.

Health Impact Assessment (HIA) as a vehicle for incorporating health in policy

A person's health status is largely determined by factors outside the control of the healthcare sector. While some of these are fixed, such as genetic factors, many are environmental in the broadest sense of the term. These operate through such socio-economic sectors as employment, education, housing, energy and transport, which structure the health risks and opportunities of individuals. In principle, they can be influenced by interventions, whether or not these are primarily motivated by health considerations. Typically the structuring is unequal – sometimes referred to as clustering of disadvantage - so that those who are less well placed socio-economically also have worse health outcomes, contributing to socio-economic inequalities in health; interventions have the potential to increase or decrease such inequalities.

The concept of health used in HIA is broader than merely the absence of disease, infirmity or injury [7]. Ideally, it encompasses all aspects of physical, mental and social health, including self-reported wellbeing, and considering positive health as well as the absence of illness. And it places emphasis on the determinants of determinants, i.e. the upstream factors that influence the experience of health and ill-health in particular populations. In addition, a participatory (or at least consultative) process is used, when time and resources permit.

HIA is concerned with the health of populations [8]. It generally attempts to predict the future health consequences – both positive and negative impacts – of a policy [9], programme or project [10](hereafter collectively referred to as a "proposal")[8,11,12]. It can be applied both to proposals whose primary aim is to promote health, and those that are differently motivated.

There are many definitions of HIA in the literature, for example "a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population and the distribution of effects within the population" [13]. The overall aim when conducting an HIA is to influence decision making to minimise the harm and maximise the health benefit of proposals [14]. This might happen in three ways: (a) by raising the general awareness among decision makers that their actions affect health; (b) by informing decision makers of the likely specific impacts of particular decisions; and (c) by helping those potentially affected by decisions to participate in proposal formulation and to contribute to decision making [12]. A second important aim is similar, but focused towards reducing health inequalities.

It can also influence decision makers, in the short-term by improving the intervention, and in the long-term through raising awareness of health and its determinants. Examples of both kinds can be found in the experience of London. After the first mayor was elected in 2000, it was decided that all mayoral strategies would be subject to HIA. The first strategy was on transport and the initial (pre-HIA) draft strategy was issued, with a strong focus on social justice and inclusion, and on the environment. The HIA suggested some additions, and a changes audit [15] has demonstrated that the following alterations were made:

- promoting sustainable travel plans for workplaces and schools;
- giving priority to infrastructure and services that benefit London's deprived communities;
- increased emphasis on promoting walking and cycling and reducing reliance on private cars, especially re-allocation of road space;
- a commitment to track the health impacts of the final strategy and its implementation.

In addition, with the HIAs of subsequent mayoral strategies, the HIAs happened at ever earlier stages, and officials became progressively more open to working with health people and more knowledgeable about the determinants of health involved in their area of work. This indicates that repetition of the HIA process had the effect of raising consciousness among officials within the London jurisdiction. However, as already mentioned, this was incompletely carried through into implementation and especially monitoring of the effects of the strategy.

HIAs may be retrospective, concurrent or prospective. A prospective HIA aims to predict the health consequences of a proposal before it has been implemented, and is the most common type. A concurrent HIA involves monitoring an intervention during implementation, and is useful when health impacts are expected but their nature and severity are uncertain, so that the work can be influenced as it progresses. A retrospective HIA takes place after the proposal has occurred, and is similar to an evaluation of its health outcomes; its main role is to provide evidence for future similar interventions, and it is not truly an HIA. However, it can be used to address health impacts that have occurred as a result of proposal implementation in order to remediate any that are negative and enhance any that are positive.

An HIA can take place at any level, from local or regional to national or supranational. Proposals subject to HIA could be originated and developed within the private, public or voluntary sector, but at the moment most HIAs are led by the public sector (health or local government).

As HIA aims to influence the development and implementation of proposals, it needs to be designed in a way that will be meaningful to decision makers, as well as to others who are likely to be affected by the proposal. In particular, it is important to remember that the task of decision makers is to weigh a large number of considerations, of which health may be only one. Considerations other than health include for example economic priorities, equity, discrimination, and equal opportunities issues, and community safety, etc. More generally, in planning an HIA it is crucial to ensure that it is structured in a way that has the potential to influence the decision making process [16]. It also needs to be conducted in accordance with key central principles to judge the impacts of the proposal, including not only *sustainable development* but also *democracy*, *ethical use of evidence* and *equity*; these four criteria are the "core values" of HIA [16].

The term "health impact assessment" is used for many different depths of appraisal, whose complexity varies, and using a wide range of resources. "Desk-top" appraisal is generally undertaken by an organisation's own officers to gain a picture of potential health impacts to inform proposal development. Rapid appraisal, also called "mini" HIA [17], generally uses existing information and evidence that is already available or easily accessible but usually also involves a half-day stakeholder appraisal workshop or other limited community or

stakeholder participation. Although termed “rapid”, preparing for the workshop and writing the subsequent report are labour-intensive over a short time period, and the cost is not necessarily low when one takes participants’ time into account [16].

Comprehensive (or “maxi” [17]) HIA involves the collection of new data. This may include a comprehensive literature review, greater participation of local residents such as through a survey, and/or a primary study of health effects of the same proposal elsewhere. For a concurrent HIA, the impacts of the proposal are studied as it is implemented. It is resource-intensive, requiring a significant time-commitment from a number of people over a prolonged time [18].

The “level” of HIA undertaken depends on:

- the timescale of the proposal;
- the resources available for the HIA; and
- the potential importance of the proposal or of the health effects.

An HIA cannot be started until a proposal is firm enough to appraise but recommendations from an HIA cannot affect decisions already taken before the report is written. Resources include not only funding but also time, staff, expertise and community development. For example, if a good quality, up-to-date systematic review is available of all the relevant scientific evidence on a subject, a “rapid” or “mini” HIA may be easily undertaken. In a more comprehensive appraisal, the existence of such a review allows a greater proportion of resources to be directed towards other components of the HIA process, such as community participation.

The HIA process comprises six main stages: screening, scoping, appraisal (also called risk assessment), formulation of recommendations and preparation then submission of the report and recommendations to decision-makers, and monitoring and evaluation [19]. It involves a range of *stakeholders* , including those who are introducing the proposal and those who will be carrying it out (such as construction firms), and those who will be most directly affected. One of the values underlying HIA is community involvement as full and active stakeholders.

Assessing impacts on inequalities

Assessing impact on inequalities in health is integral to most models of HIA. The more common approach considers impacts on specific excluded or vulnerable groups. However, it is also important to consider a possible gradient of effects or susceptibility across the whole population (e.g. by income, occupational social class, or educational level). In most cases, potentially vulnerable groups, defined by age, gender, ethnicity, ethnicity, deprivation, or other disadvantage, can be postulated. Such groups are characterised (for example, the number of people and their location) during profiling.

Whether inequalities represent inequity is a matter of judgement. “Inequality” refers to objective differences, but inequity conveys unjust differences [20]. The former can in principle be measured whereas the latter is harder to assess. For example, differing educational attainment can be monitored objectively, but whether or not it represents inequity includes elements of judgement and viewpoint. Subtle differences in opportunity, such as quality of teaching and parental support, which could indicate inequity, are much harder to determine; if the only difference is due to the students’ own effort, opinions may vary as to whether this represents inequity. Inequalities can also be advocated, for example providing more resources per capita in areas of higher need to reduce inequity.

Proposals may impact on equity in four ways:

- No differential effects – for example the same percentage increase in mortality is anticipated among affluent and deprived groups, thereby exacerbating existing inequalities in absolute terms
- Differential individual susceptibility, such as the greater risk from air pollution for people with severe cardio-respiratory disease - for quantifiable effects, different exposure-effect estimates may sometimes be available [21]
- Differential aggregate susceptibility because of a larger population of susceptible individuals, e.g. cardio-respiratory diseases are more common in less affluent and less educated groups
- Differential exposure – for example, air pollution in London is correlated with deprivation, so the predicted falls due to intervention are greatest in the most deprived areas [22]. For air pollution, the groups most susceptible to exposure have the highest baseline exposure, and falls in pollution may therefore cause reductions in health inequalities.

Estimating effects on inequalities and vulnerable or excluded groups requires the same processes as for the whole population but the effects are described or quantified after stratifying the population into those subgroups; it uses the relevant prevalence of risk factors, effects of exposure, and changes in exposure for each of the subgroups. The effects are then compared with the effect on the population as a whole or with other subgroups.

The role of evidence

When choosing outcomes to examine in an HIA it should be remembered that what is important may not be measurable [23] and that which is measured routinely or can be measured may be unimportant [23]. For example, community severance is a recognised adverse effect of traffic, limiting access to goods, services and social networks, and impeding independent mobility [24], but there is no simple or routine measure of such severance, so no quantified assessment of severance can be made at baseline nor quantified estimates made of the effects of proposals. Quantified assessments are necessary for economic appraisal or for other explicit trade-offs: some decision-makers may give more weight to those outcomes that can be measured (such as traffic levels or estimates of deaths caused by injuries) than to a qualitative statement ("access to healthcare will be impeded").

The reduction in risk attributable to a *fall* in a given exposure *consequent on a proposal*, i.e. the *achievable* reduction, may be small, even if the burden of disease [25](attributable risk) from the same exposure is high [1]. Where cause and effect are well established, a proxy measure can be used instead of the eventual health outcomes, for example monitoring air pollution rather than admissions for or mortality from cardio-respiratory diseases. The health impacts can then be modelled [26].

Literature searching and involving technical experts

Synthesising the evidence for HIA has a number of difficulties: usually the evidence on the effects of interventions and on the reversibility of impacts is sparse; the evidence base is diverse, utilising studies from different disciplines and a wide range of designs; a range of individuals from different backgrounds and with varying priorities, concerns, and prior beliefs is involved; decision-makers need recommendations even if the quality of the evidence is inadequate; and timescales are typically tight [27]. Much useful information is available only as "grey" literature, reports not published in scientific journals. This presents problems of identifying that such reports exist, obtaining copies, and assessing the rigour of the work.

"Off-the-shelf" reviews conducted proactively by technical experts on topics frequently the subject of HIA (e.g. regeneration [28] and transport [24]) can enable local expertise to concentrate on local concerns and community participation [1]. Readily available evidence

reviews, available via the internet, can expedite robust local HIA [29]. Use of existing expert reviews can also facilitate separation of the technical work of HIA from the political processes of policy development and decision-making [1].

Few HIAs have included formal evaluation of the type reported above for the transport HIA in London. And the HIA process has been subject to criticism.

Criticism of HIA as a policy support process

A useful recent example of criticism is that paper by Thomson [30]. As she says, HIA could in principle provide a structured mechanism to promote healthy public policy outside the healthcare sector, but she is sceptical of its ability to deliver that. She identifies the main issues as the extent to which HIA actually influences practical policy, and the quality of the evidence base that is used to conduct HIA.

The extent to which HIA influences practical policy

The process of carrying out HIA involves extensive consultation, and this can have positive effects, if it is done well – which is not easy. In particular it can give a voice to the voiceless – local disadvantaged populations affected by the proposed intervention.

Nevertheless, as Thomson says, awareness may rise, but does this really affect the outcome? We know less about this than we should. How much impact did the series of HIAs have on the health of people in London? Even the transport HIA only had the changes audit described above, and this is more than is usual with HIAs. There was no follow-up monitoring or evaluation. We therefore do not know how much effect (if any) it had on the major determinants of health, let alone on health outcomes.

Furthermore, to answer the question on health gain properly, it is necessary to do more than just show a positive effect. Even if one is present, its magnitude needs to be compared with what needs to be done; not just effectiveness but sufficient impact.

The effect also needs to be compared to the resources used; not just effectiveness but also efficiency. This is an important practical issue, because officials are typically faced with a large number of impact assessments and similar exercises, and it is unjustifiable to burden them with relatively unproductive work. One answer to this is to seek to streamline the process – Integrated Impact Assessment. Another is to streamline the health-impact work by doing much of it at a more strategic level (see below).

Standard of the evidence base

Thomson is right to stress the need for high quality evidence in assessing health impacts. Peer-reviewed literature is the most reliable way to achieve that, and it is true that research evidence has been underused in HIA. The availability and the use of good evidence are increasing, both quantitative and qualitative, but not very rapidly.

The research needs of HIA are commonly misunderstood: often it may be possible to relate health outcomes to their immediate determinants with some confidence, but less information is available on what affects those determinants. In other words, the research gaps tend to be “upstream”, and in particular, information is lacking on the effects of interventions as well as on their characteristics, e.g. reversibility and generalisability.

This affects the results of literature reviews: for example, it is known that pro-bicycle policies in York led to a large increase in cycling, and also that cycling is good for health – but as no

HIA or health research was done there, this example is invisible in a health-based search. The participation of topic experts is invaluable for bringing “upstream” pathways into clear view, and this is typically impossible for most HIAs.

In relation to obtaining the needed research evidence, the priorities are its quality and its relevance. Whether or not it is carried out as part of an HIA is secondary. It is rare for an HIA to be of the research quality that would merit inclusion in standard medical bibliographic databases, and it is likely to remain true that most HIAs only reach the grey literature.

An alternative approach: Strategic Health Assessment

As Thomson says, HIA has its limitations. What could be done about them? One suggestion is to apply a similar concept at a more strategic level – “Strategic Health Assessment” (SHA) [31]. This would resemble HIA in including both positive and negative impacts, and unintended as well as intended consequences, and in having a broad definition of health, but would focus more thoroughly on the scientific evidence.

Policy areas with an important health dimension would be eligible for SHA. The underlying values would be similar to those of HIA: (a) maximising health gain and minimising health loss; (b) aiming to reduce social inequalities in health; and (c) helping to achieve the best overall trade-offs between health and other dimensions of sustainable development, including competitiveness and non-health aspects of the environment. Responsibility and accountability would be clearly assigned and ethical aspects as well as uncertainties made explicit. It would be carried out by experts who have the necessary expertise in health and in the appropriate complementary areas, and who are independent of vested interests.

SHA would aim to provide evidence to inform decision makers at all levels of government, and including the private and voluntary sectors as well as the public sector. It would also provide a sound and updatable evidence base for specific HIAs in the same topic area. This could prove more efficient in the analysis of health impacts, as the same result might be achievable with fewer resources. It would identify trade-offs, as well as synergies for example that replacing car dependence with active modes of transport would reduce greenhouse gas emissions while increasing physical activity [32]. It would also pay particular attention to social inequalities in health and to vulnerable groups.

SHA could also explore the health impacts of key policy *options*, whether or not they have a primary health motivation. This should include those options that are not currently feasible for political or economic reasons, but may do so in the future. It would take into account employment, competitiveness, economic costs and the socioeconomic environment. A priority need is information on the effectiveness and the cost-effectiveness of interventions. In all these ways it would contribute to healthy public policy and to joined-up policy.

Diagrams

Thomson also suggests that HIA needs to map the pathways more explicitly than is currently done. As she says, as well as being useful practically, this could help to set a research agenda. It could involve not only intervention studies and epidemiology as she suggests, but also other types of evidence, for example on what policies produce a modal shift in transport – in other words, on the upstream pathways. The systematic involvement of topic experts in these complementary disciplines would be essential, breaking down the barriers between “silos” of different types of expertise.

Diagrams of this type have been used for some time, e.g. in the context of climate change [33], urban transport [34] and food/nutrition [34]. They are a powerful tool, which make

assumptions explicit, and can provide a framework for statistical analysis and modelling, generate testable predictions and explore the effects of intervention [35]. They are highly intuitive, and this also carries the danger that they can be misused.

The starting point is a structure of the main causal processes that could be involved. This summarises the empirical evidence, but necessarily also incorporates judgements based on subject knowledge where the evidence is inadequate. As the research results accumulate, the status of the diagram progresses from relatively tentative to soundly evidence based [35]. This is a stronger philosophical position than the naïve inductivism of much epidemiology [35], for example it makes it harder to confuse "evidence of absence" with "absence of evidence".

Most such diagrams end with one or more health endpoints, with a layer above that of the proximal health determinants, and so on back through the determinants of determinants. If they are constructed as "change" rather than "level" diagrams, it is straightforward to trace the causal pathways back to policy options [35]. In this sense they are top-down, with the health outcomes at the bottom of the diagram. However, in some cases health is not only an outcome but also a possible determinant of economic activity such as labour productivity; in other words there is circular causation (or feedback), which lends itself naturally to such causal diagramming. This may be the case in conditions of absolute poverty, in which household health status may influence the ability of family members to work effectively [36].

The question of different audiences is raised by Thomson, and it is important that academic papers need to be supplemented by research syntheses, for use e.g. by policy-makers and HIA practitioners; this is routinely done in other areas [37,38]. But it does not address the question of "ordinary people", and for the major challenges facing us, ways have to be found for engaging a wider public audience in the debate.

Conclusion

Humanity faces a number of crises, some ancient such as absolute poverty and hunger, and some new such as global climate change, and obesity and related conditions that are due to poor diet and inadequate physical activity. There are also numerous other important issues that need to be addressed. Sustainable development is essential, but is difficult to implement concretely. I propose that Strategic Health Assessment is one tool that could be developed to assist in the knowledge base required for the tasks we face.

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